Fig.1

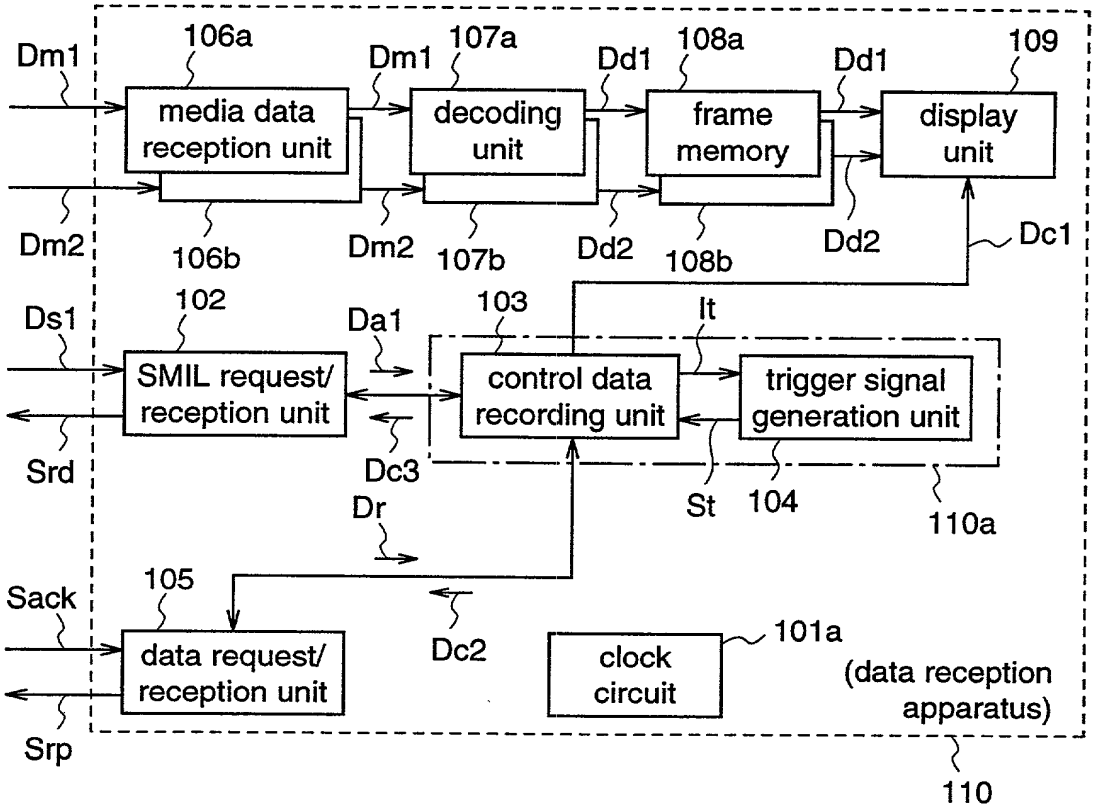

Dm1
106a
media data reception unit
Dm1
107a
decoding unit
Dd1
108a
frame memory
Dd1
109
display unit
Dm2
106b
Dm2
107b
Dd2
108b
Dd2
Dc1
Ds1
102
SMIL request/ reception unit
Da1
103
control data recording unit
It
trigger signal generation unit
Srd
Dc3
St
104
110a
Dr
Sack
105
data request/ reception unit
Dc2
clock circuit
101a
(data reception apparatus)
Srp
110

Fig.2

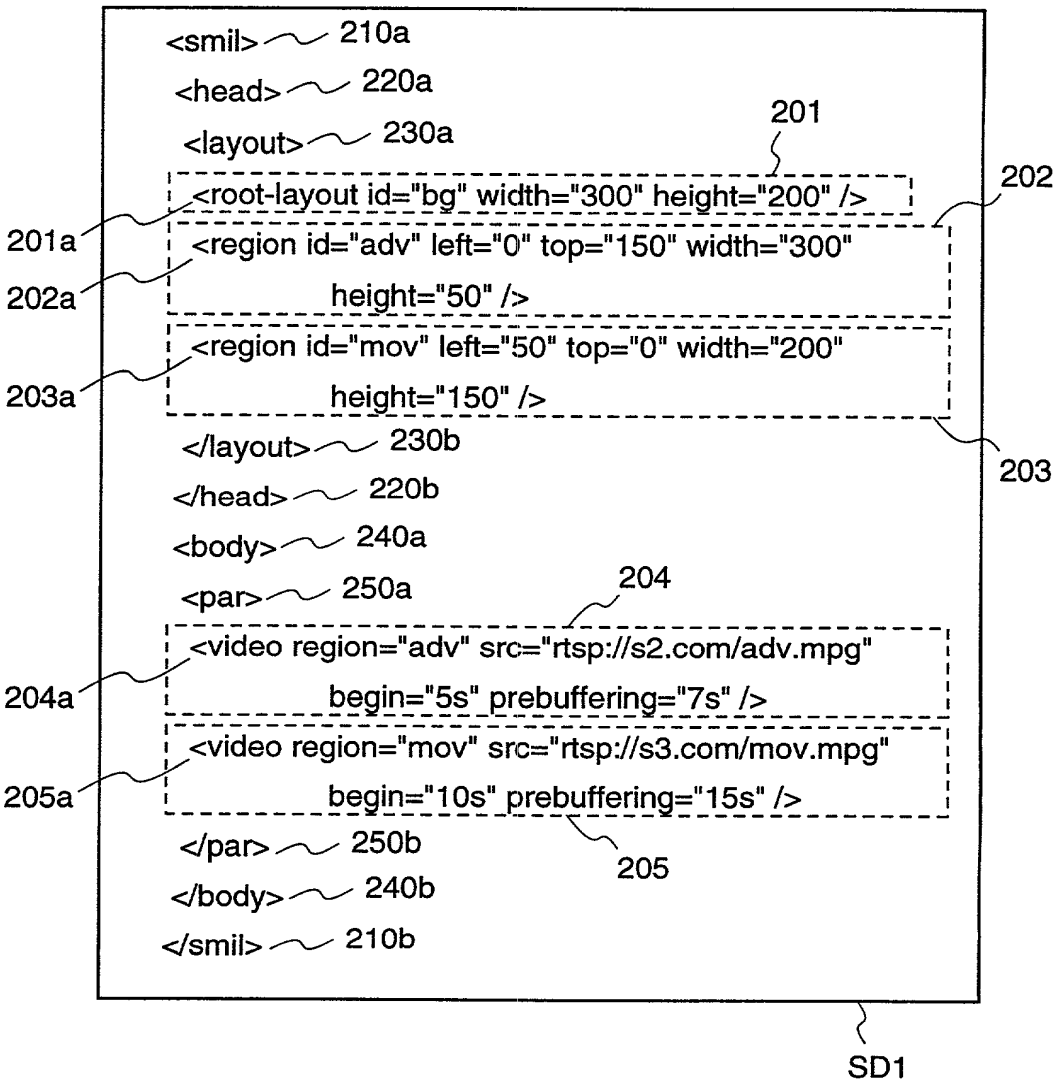

<smil> 210a
<head> 220a
<layout> 230a
201
202
<root-layout id="bg" width="300" height="200" />
201a
<region id="adv" left="0" top="150" width="300"
height="50" />
202a
<region id="mov" left="50" top="0" width="200"
height="150" />
203a
203
</layout> 230b
</head> 220b
<body> 240a
<par> 250a
204
<video region="adv" src="rtsp://s2.com/adv.mpg"
begin="5s" prebuffering="7s" />
204a
<video region="mov" src="rtsp://s3.com/mov.mpg"
begin="10s" prebuffering="15s" />
205a
205
</par> 250b
</body> 240b
</smil> 210b
SD1

Fig.3 (a)

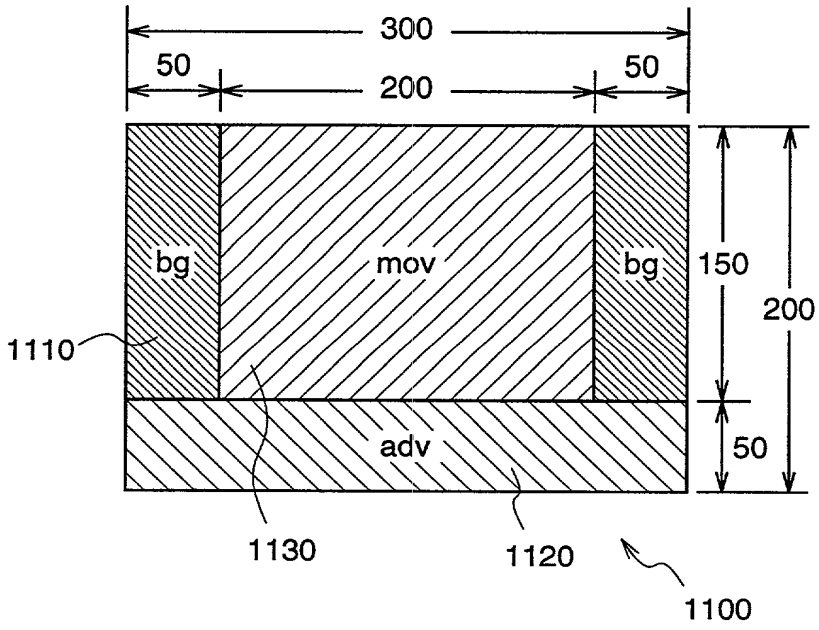

300
50
200
50
bg
mov
bg
150
200
1110
adv
50
1130
1120
1100

Fig.3 (b)

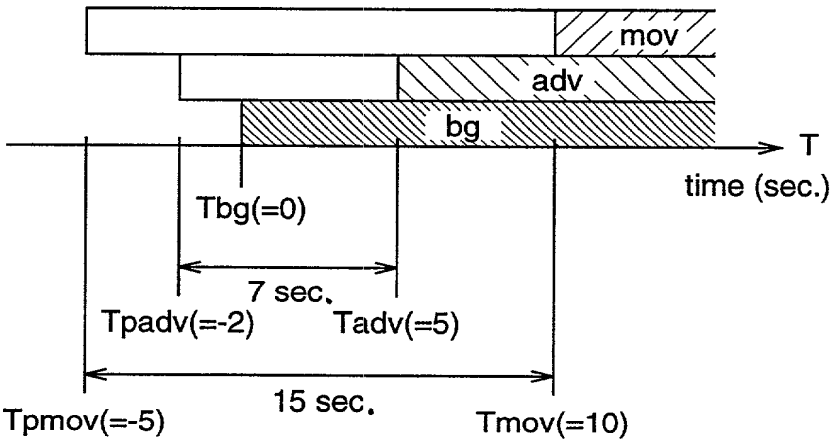

mov
adv
bg
T
time (sec.)
Tbg(=0)
7 sec.
Tpadv(=-2)
Tadv(=5)
15 sec.
Tpmov(=-5)
Tmov(=10)

Fig.4

	#	time	control target	control command
E1	1	-5	request unit	PLAY rtsp://s2.com/mov.mpg
E2	2	-2	request unit	PLAY rtsp://s2.com/adv.mpg
E3	3	0	display unit	bg//width300/height200
E4	4	5	display unit	adv//left0/top150/width300/height50
E5	5	10	display unit	mov//left50/top0/width200/height150

Tab

Fig.5

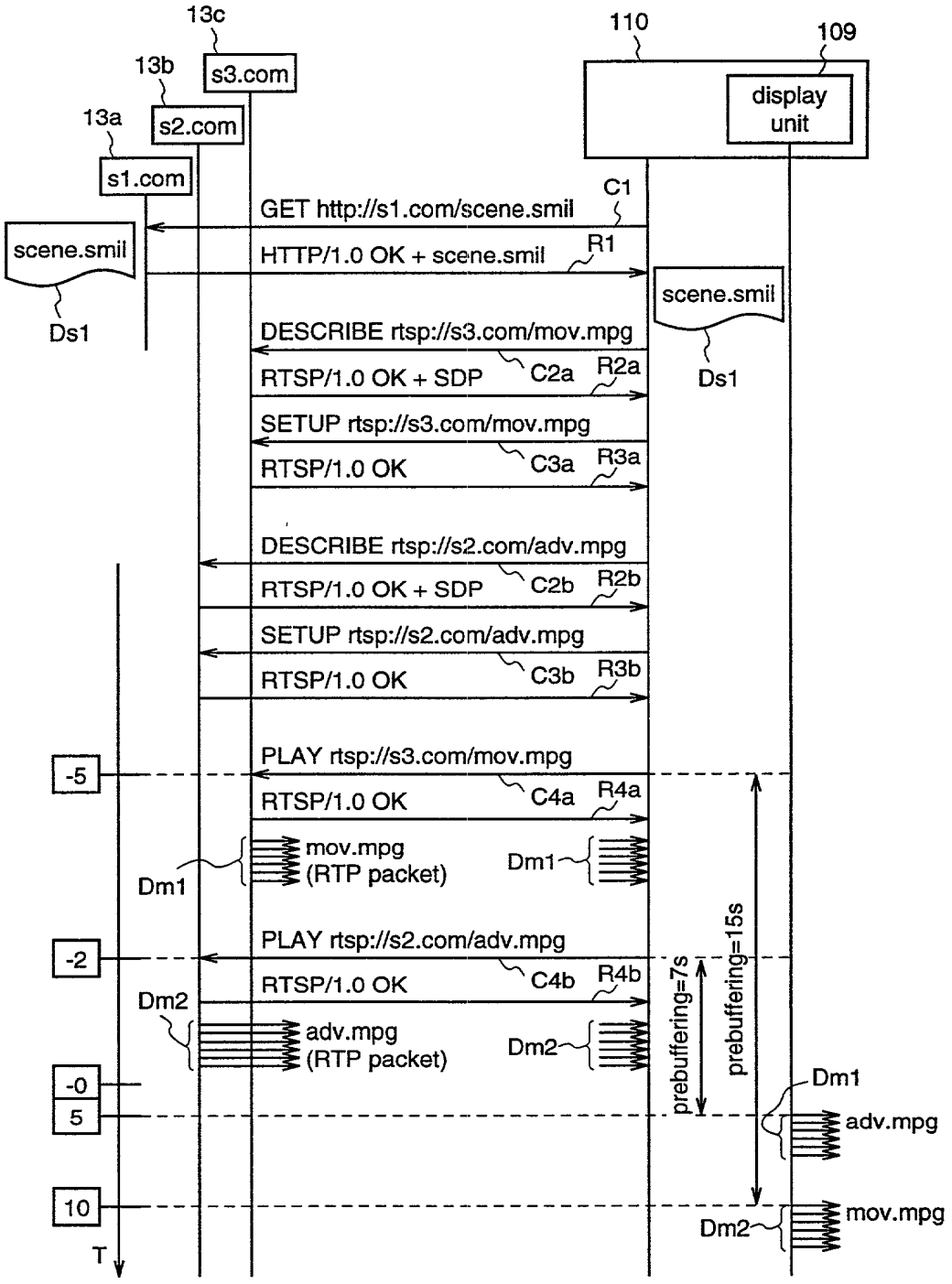

13c
s3.com
13b
s2.com
13a
s1.com
110
109
display unit
C1
GET http://s1.com/scene.smil
scene.smil
HTTP/1.0 OK + scene.smil
R1
scene.smil
Ds1
Ds1
DESCRIBE rtsp://s3.com/mov.mpg
RTSP/1.0 OK + SDP
C2a
R2a
SETUP rtsp://s3.com/mov.mpg
RTSP/1.0 OK
C3a
R3a
DESCRIBE rtsp://s2.com/adv.mpg
RTSP/1.0 OK + SDP
C2b
R2b
SETUP rtsp://s2.com/adv.mpg
RTSP/1.0 OK
C3b
R3b
-5
PLAY rtsp://s3.com/mov.mpg
RTSP/1.0 OK
C4a
R4a
Dm1
mov.mpg
(RTP packet)
Dm1
-2
PLAY rtsp://s2.com/adv.mpg
RTSP/1.0 OK
C4b
R4b
Dm2
adv.mpg
(RTP packet)
Dm2
prebuffering=7s
prebuffering=15s
-0
5
Dm1
adv.mpg
10
Dm2
mov.mpg
T

Fig.6

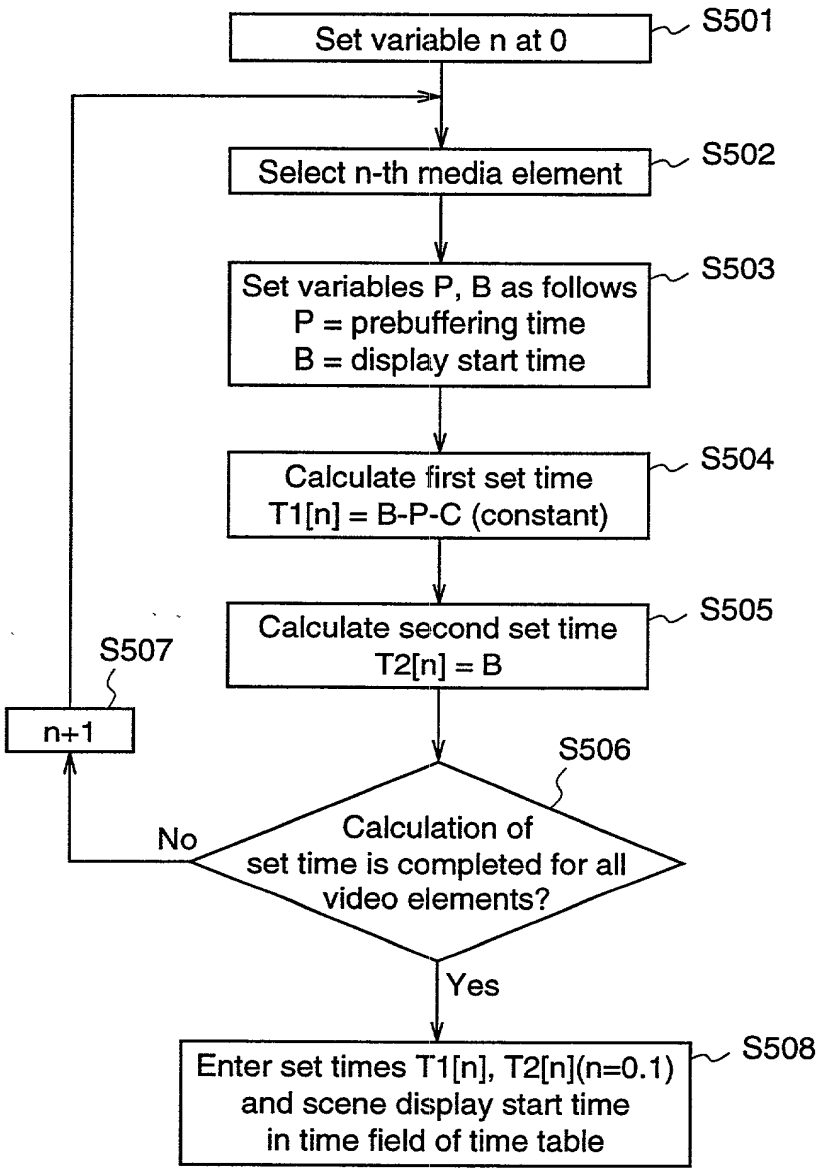

Set variable n at 0
S501
Select n-th media element
S502
Set variables P, B as follows
P = prebuffering time
B = display start time
S503
Calculate first set time
T1[n] = B-P-C (constant)
S504
Calculate second set time
T2[n] = B
S505
S506
Calculation of
set time is completed for all
video elements?
No
Yes
S507
n+1
Enter set times T1[n], T2[n](n=0.1)
and scene display start time
in time field of time table
S508

Fig.7

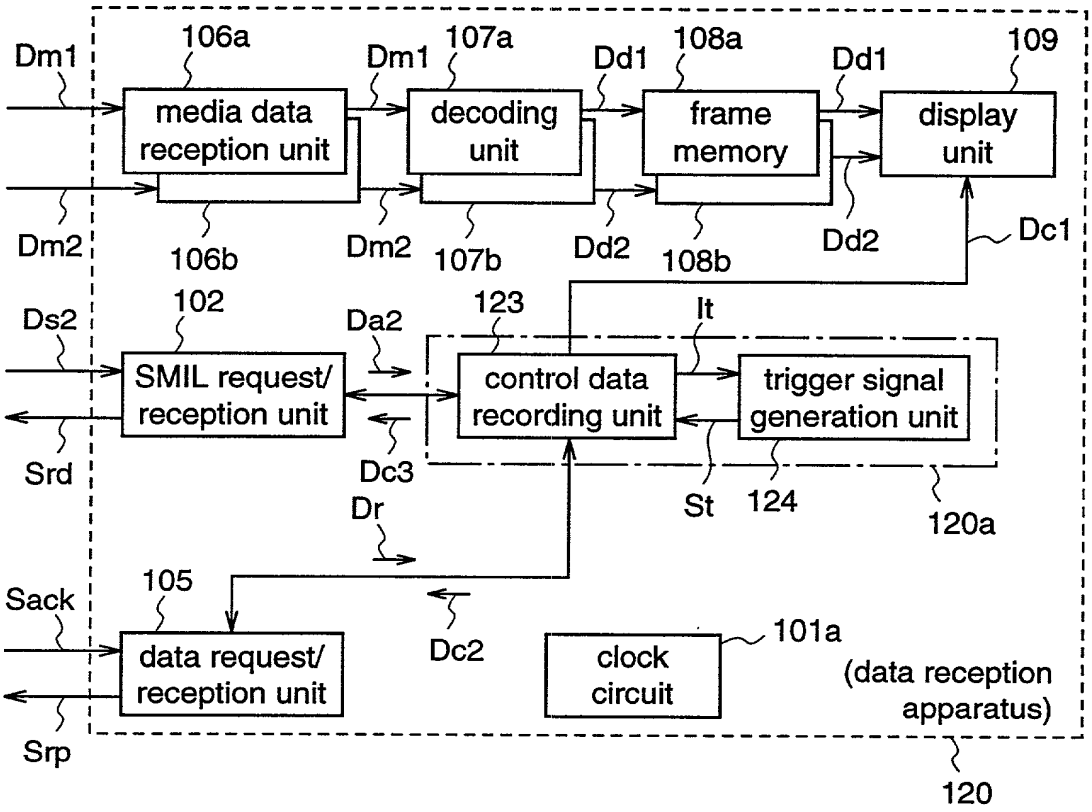

Dm1
106a
media data reception unit
Dm1
107a
decoding unit
Dd1
108a
frame memory
Dd1
109
display unit
Dm2
106b
Dm2
107b
Dd2
108b
Dd2
Dc1
Ds2
102
SMIL request/ reception unit
Srd
Da2
123
control data recording unit
It
trigger signal generation unit
Dc3
St
124
120a
Dr
Sack
105
data request/ reception unit
Srp
Dc2
clock circuit
101a
(data reception apparatus)
120

Fig.8

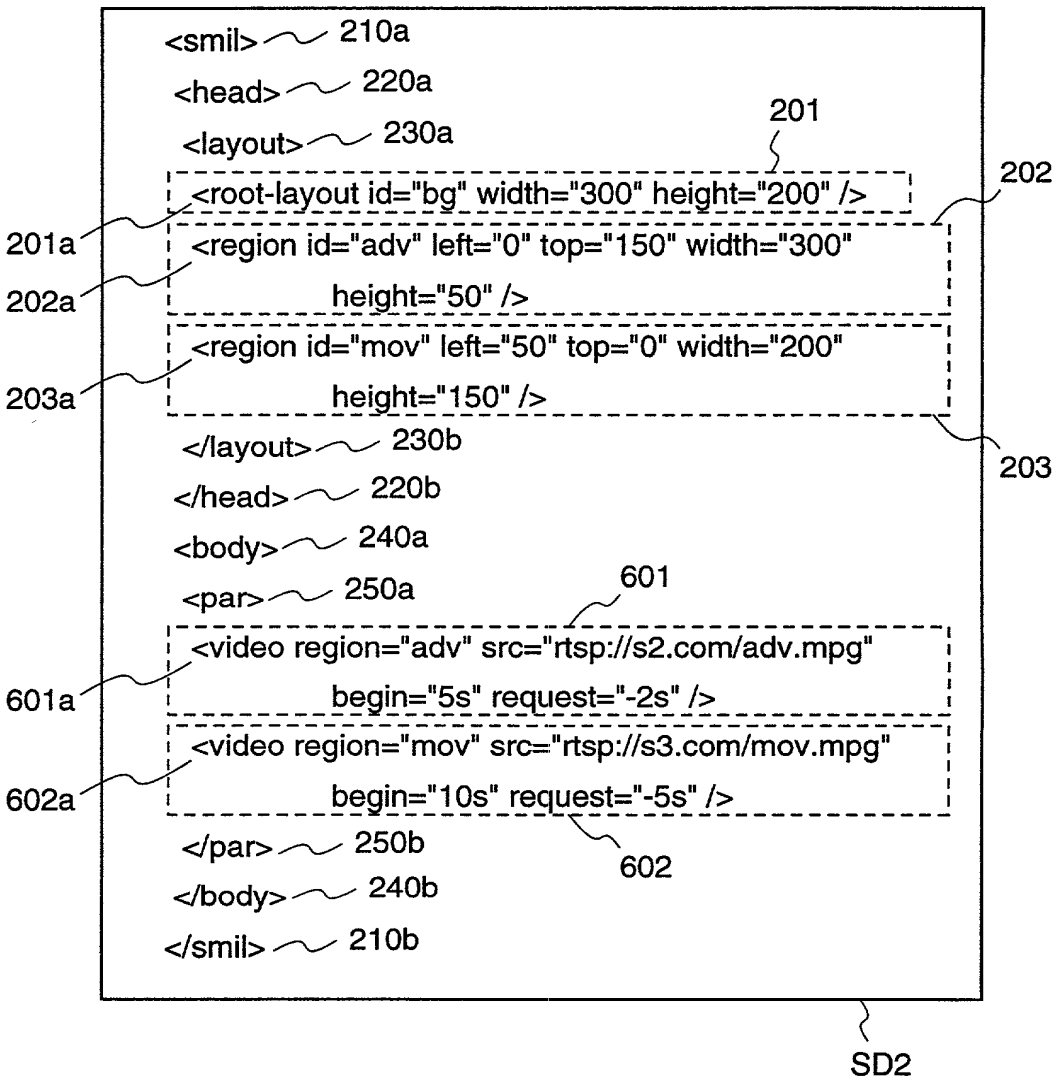

<smil> 210a
<head> 220a
<layout> 230a
201
202
<root-layout id="bg" width="300" height="200" />
201a
<region id="adv" left="0" top="150" width="300"
202a
height="50" />
<region id="mov" left="50" top="0" width="200"
203a
height="150" />
203
</layout> 230b
</head> 220b
<body> 240a
<par> 250a
601
<video region="adv" src="rtsp://s2.com/adv.mpg"
601a
begin="5s" request="-2s" />
<video region="mov" src="rtsp://s3.com/mov.mpg"
602a
begin="10s" request="-5s" />
602
</par> 250b
</body> 240b
</smil> 210b
SD2

Fig.9

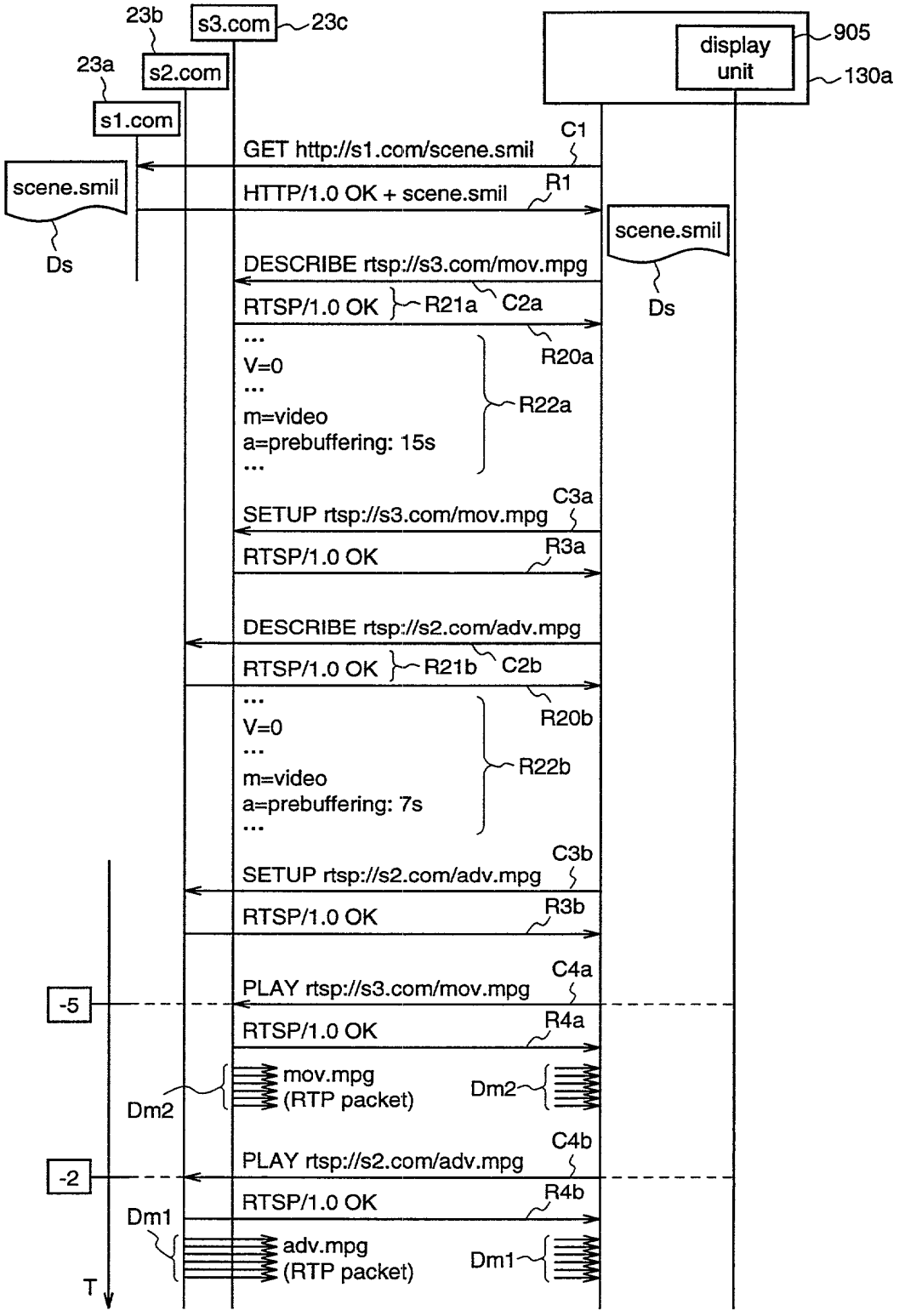
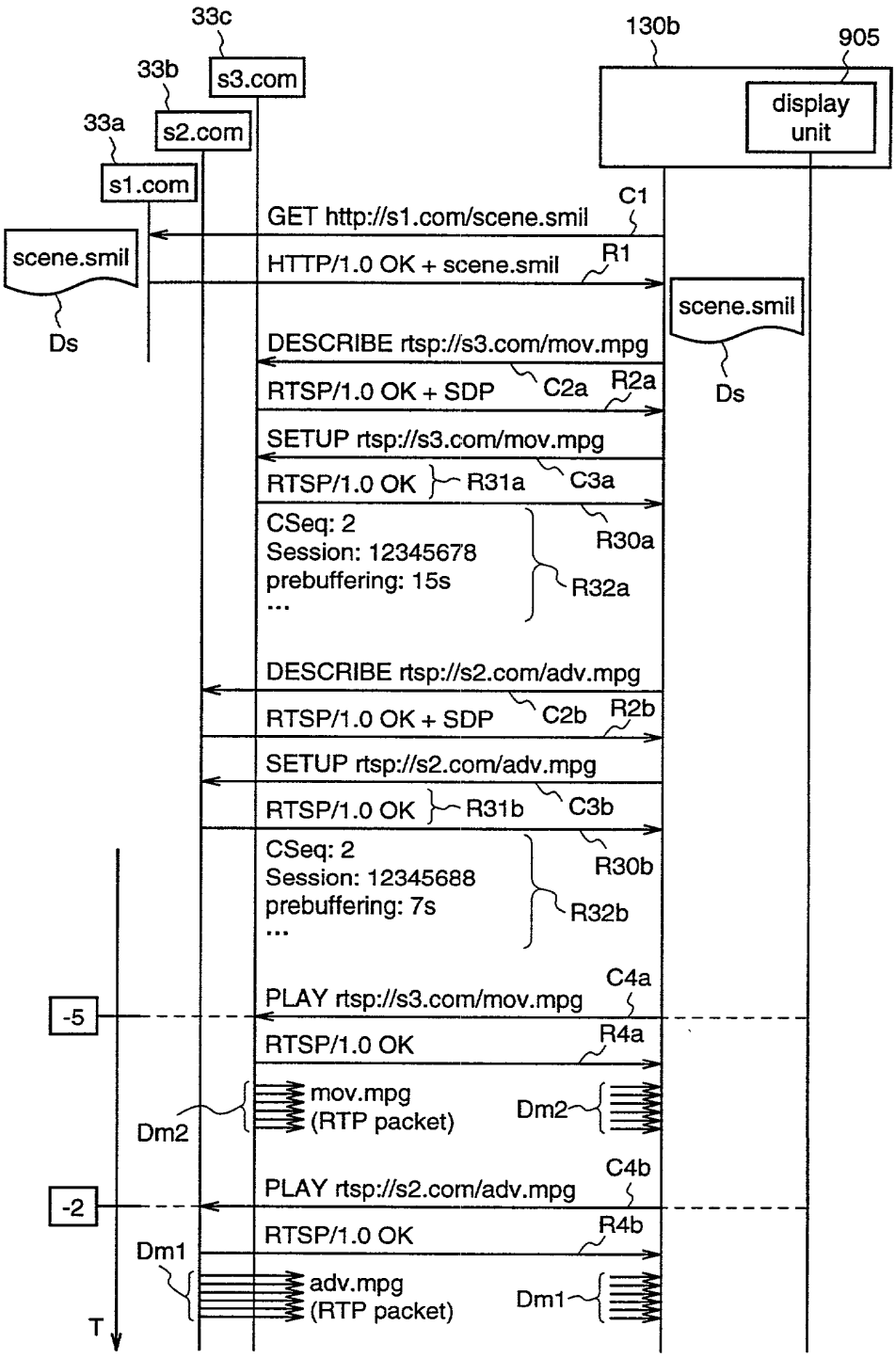

23b
s3.com
23c
23a
s2.com
s1.com
display unit
905
130a
C1
GET http://s1.com/scene.smil
scene.smil
R1
HTTP/1.0 OK + scene.smil
scene.smil
Ds
Ds
DESCRIBE rtsp://s3.com/mov.mpg
RTSP/1.0 OK
R21a
C2a
R20a
...
V=0
...
m=video
a=prebuffering: 15s
...
R22a
C3a
SETUP rtsp://s3.com/mov.mpg
RTSP/1.0 OK
R3a
DESCRIBE rtsp://s2.com/adv.mpg
RTSP/1.0 OK
R21b
C2b
R20b
...
V=0
...
m=video
a=prebuffering: 7s
...
R22b
C3b
SETUP rtsp://s2.com/adv.mpg
RTSP/1.0 OK
R3b
C4a
-5
PLAY rtsp://s3.com/mov.mpg
RTSP/1.0 OK
R4a
Dm2
mov.mpg
(RTP packet)
Dm2
C4b
-2
PLAY rtsp://s2.com/adv.mpg
RTSP/1.0 OK
R4b
Dm1
adv.mpg
(RTP packet)
Dm1
T

Fig.10


33c
s3.com
33b
s2.com
33a
s1.com
130b
905
display unit
C1
GET http://s1.com/scene.smil
scene.smil
R1
HTTP/1.0 OK + scene.smil
scene.smil
Ds
Ds
DESCRIBE rtsp://s3.com/mov.mpg
C2a
R2a
RTSP/1.0 OK + SDP
SETUP rtsp://s3.com/mov.mpg
C3a
RTSP/1.0 OK
R31a
CSeq: 2
Session: 12345678
prebuffering: 15s
...
R30a
R32a
DESCRIBE rtsp://s2.com/adv.mpg
C2b
R2b
RTSP/1.0 OK + SDP
SETUP rtsp://s2.com/adv.mpg
C3b
RTSP/1.0 OK
R31b
CSeq: 2
Session: 12345688
prebuffering: 7s
...
R30b
R32b
C4a
PLAY rtsp://s3.com/mov.mpg
-5
R4a
RTSP/1.0 OK
Dm2
mov.mpg
(RTP packet)
Dm2
C4b
PLAY rtsp://s2.com/adv.mpg
-2
R4b
RTSP/1.0 OK
Dm1
adv.mpg
(RTP packet)
Dm1
T

Prior Art

Fig.11 (a)

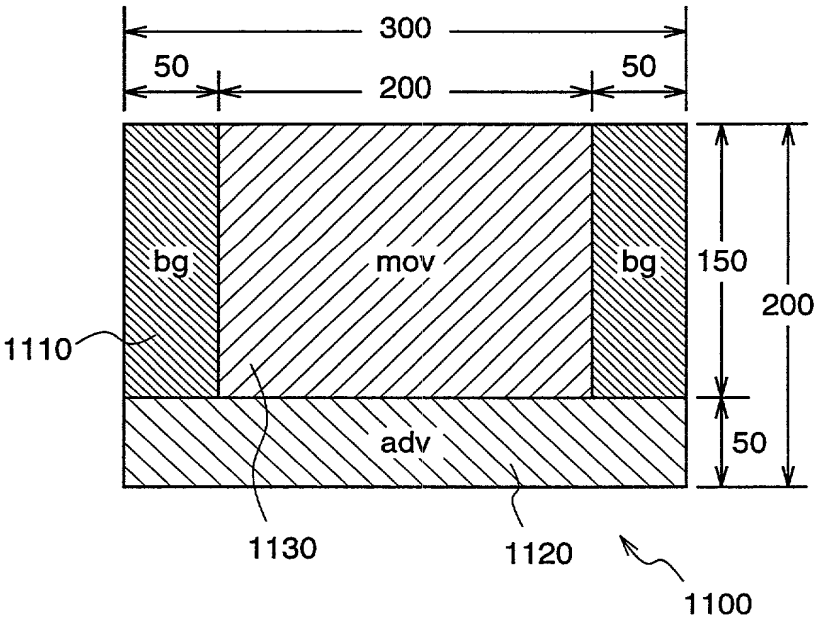


Fig.11 (b)

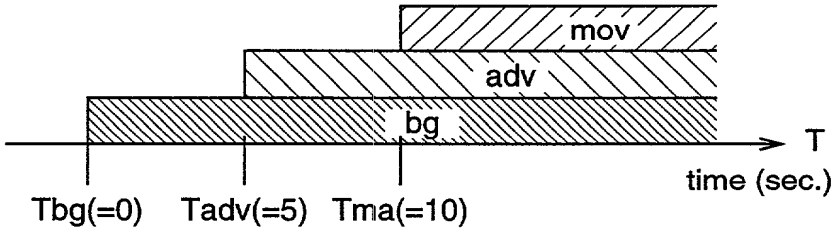


Fig.12 Prior Art

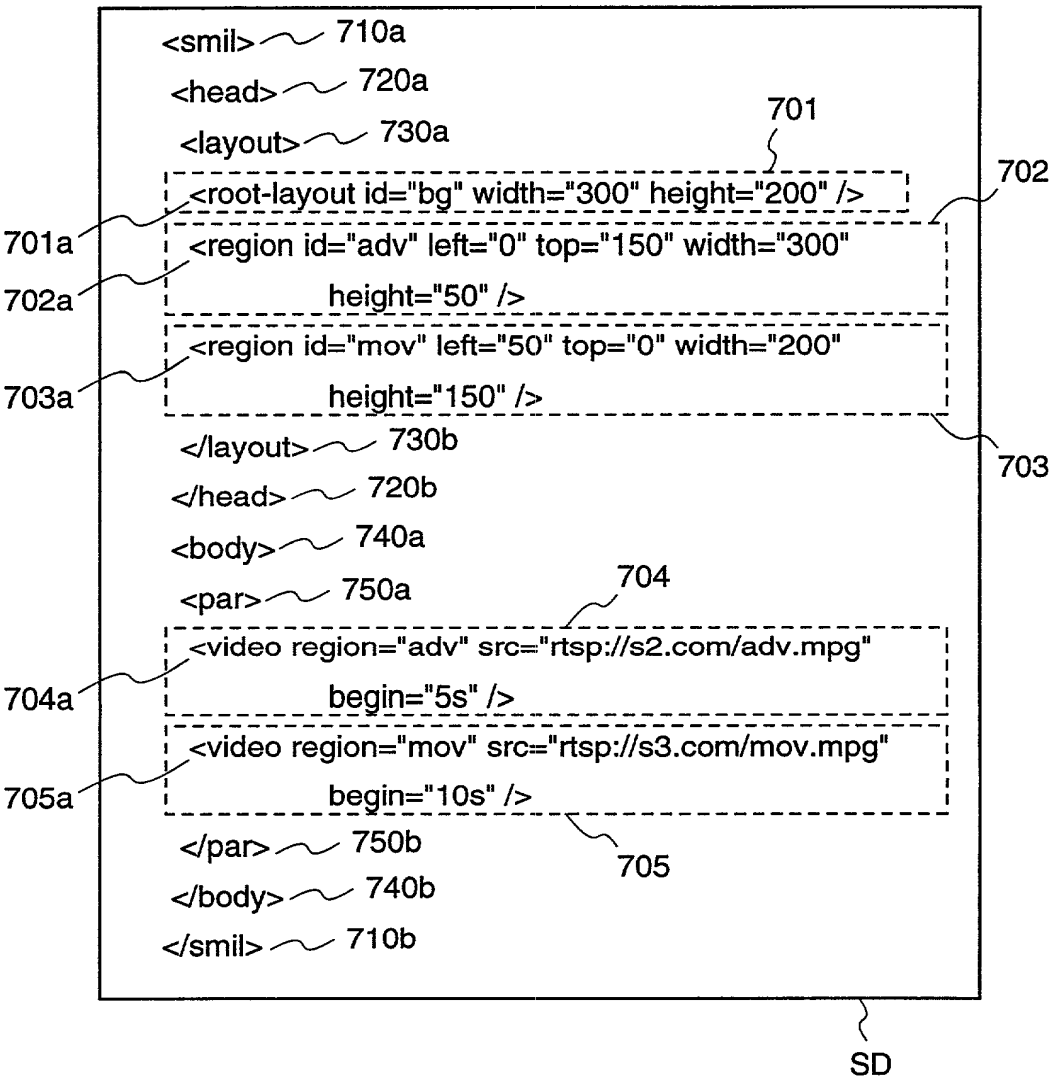


Fig.13 Prior Art

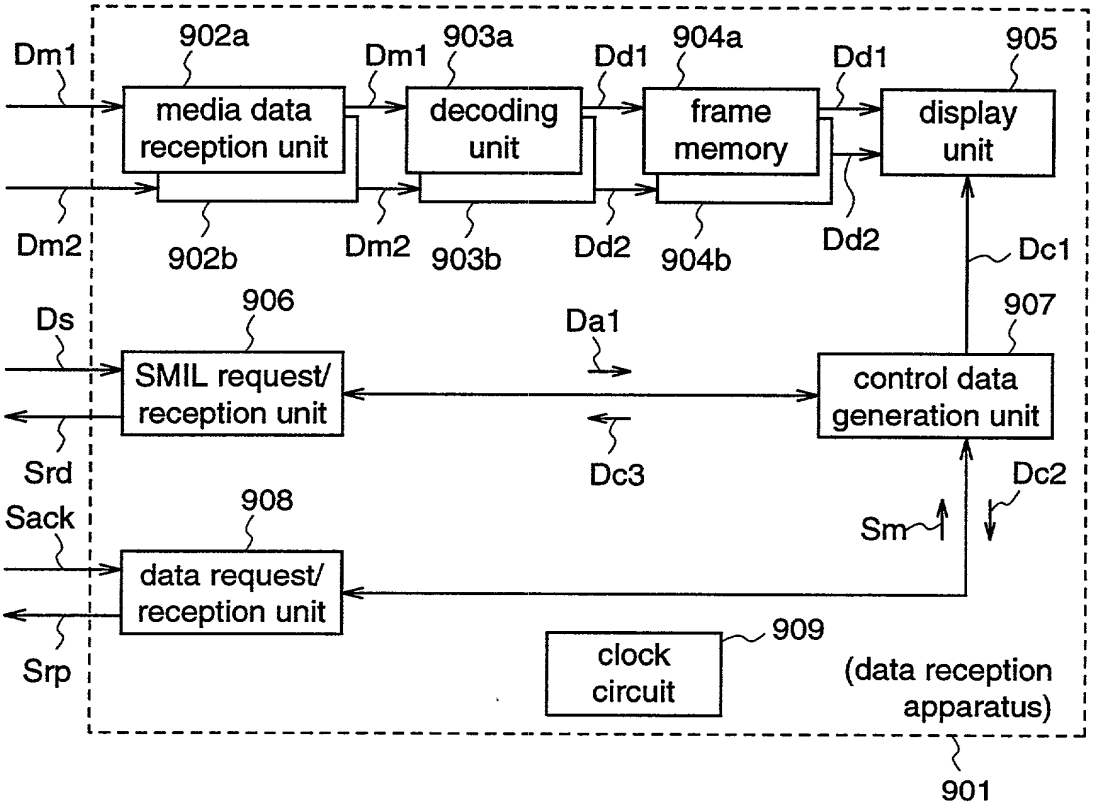
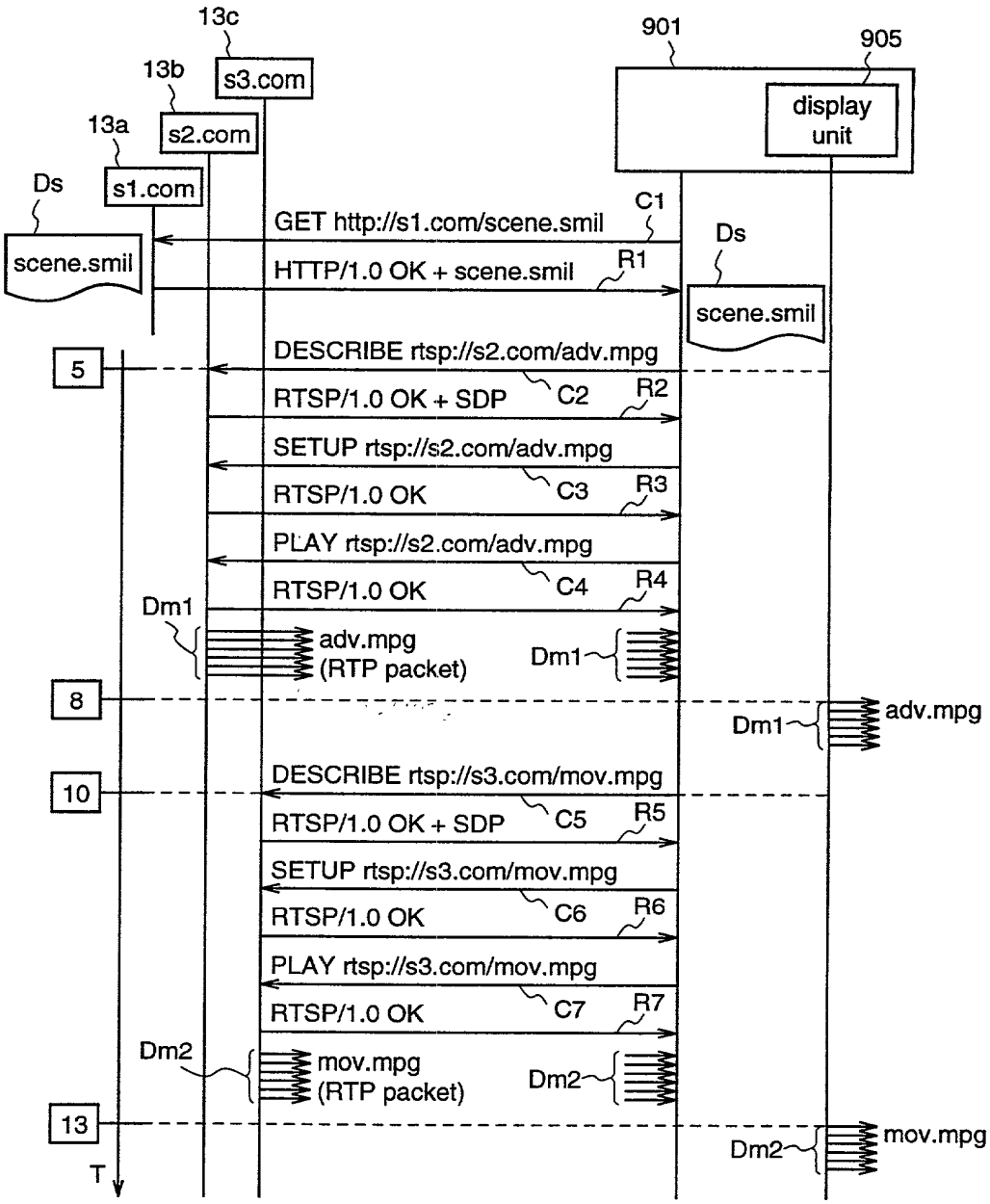



Fig.14 Prior Art